

IX.—*A List of the Birds of the Islands of the Coast of Yucatan and of the Bay of Honduras.* By OSBERT SALVIN, M.A., F.R.S., &c.

[Conclusion*.]

ADDENDA.

BEFORE proceeding to analyse the foregoing lists, I have to add the names of the following species accidentally omitted therefrom :—

+147 A. BUTEOLA BRACHYURA.

Buteola brachyura (Vieill.) ; Sharpe, Cat. B. Brit. Mus. i. p. 201.

Buteo brachyura, Ridgw. Proc. U.S. Nat. Mus. viii. p. 578. Cozumel I.

Included by Mr. Ridgway in his list, but not represented in Mr. Gaumer's collection. The species has a wide range in tropical America, but is rare on the mainland of Central America.

+147 B. ICTINIA PLUMBEA.

Ictinia plumbea (Gm.) ; Sharpe, Cat. B. Brit. Mus. i. p. 364.

Ruatan I.

A species of wide range in tropical America and not uncommon in Central America, especially in the pine-forests of the lowlands.

I have further to state that, until recently, I have always looked upon *Fireo olivaceus* as a winter visitor to Mexico and Central America. We have, however, recently received, both from Mr. W. B. Richardson and Mr. Blancaneaux, eggs of this species along with the parent birds ; so that its residence in Eastern Mexico and British Honduras is proved, and almost certainly extends to the Bay Islands, whence skins have been sent us.

* For preceding parts see 'Ibis,' 1888, pp. 241-265 ; 1889, pp. 359-379.

SUMMARY.

The apparent number of species found in the islands under consideration thus becomes 215, but from these must be deducted No. 52, *Hirundo erythrogaster* $\times$ *swainsoni*, to all appearance a hybrid; the total thus becomes 214.

In the list of 214 species, as thus amended, we find the names of 79 which belong to birds which annually migrate from North America to Mexico, Central or South America, or the West-Indian Islands, and either reside during the winter months on the islands now under consideration, or rest there during passage in autumn and spring. The only point which I propose to notice in connexion with these migratory species is that we find several that occur here at almost, if not quite, the western limit of their range. The following species come under this category:—*Turdus fuscescens*, *T. aliciae*, *Protonotaria citrea*, *Dendræca cærulescens*, *D. discolor*, *D. palmarum*, and *Perissoglossa tigrina*. The remaining migratory species are birds of wider range, which spread much further westwards in their spring and autumn flight; their presence therefore on these islands is of no special interest.

Of the remaining 135 species, 27 are birds which frequent the sea-coast or marshes adjoining, and are of very wide range, so that their presence also is of no special significance.

This leaves 108 species, belonging to no less than 84 genera, the distribution of which I propose to examine. They are given in the annexed table (pp. 86–89).

Before analysing the list in detail, it is necessary to examine the 32 birds which form the resident fauna of Meco Island. In the first place we find here no less than 9 genera, represented by as many species, which are not found on any of the other islands. All of these genera are characteristic of the fauna of the mainland. Of the species, *Phænicothraupis insularis* alone is an island race, and is also found on Mugeris Island. The only species that has any special West-Indian affinity is *Elainea martinica*, and this is of very doubtful value.

Islands, Mainland, and West Indies.	Islands and Main- land.	Islands and West Indies.	Islands only.		Meco.	Holbox.	Mugeres.	Cozumel.	Ruatan.	Bonacca.
†	...	...	...	1. <i>Turdus</i>	†	...	†	†		
	*	...	...	1. <i>grayi</i>	*	...	*	*		
	†	...	...	2. <i>Melanoptila</i>		...		†		
	*	...	...	2. <i>glabirostris</i>		...		*		
	†	...	...	3. <i>Harporhynchus</i>		...		†		
		*	...	3. <i>guttatus</i>		...		*		
†	...	...	...	4. <i>Mimus</i>	†	†	†	†		
*	...	...	...	4. <i>gilvus</i>	*	*	*	*		
†	...	...	...	5. <i>Poliopitila</i>		...		†	†	
		*	...	5. <i>cæsiogaster</i>		...		*	*	
	*	...	...	6. <i>bilineata</i>		...		*	*	
†	...	...	...	6. <i>Troglodytes</i>		...		†		
		*	...	7. <i>beani</i>		...		*		
†	...	...	...	7. <i>Dendroeca</i>		†	...	†	...	†
		*	...	8. <i>petechia</i>		...		*		
	*	...	...	9. <i>bryanti</i>		*		...	...	*
†	...	...	...	8. <i>Vireo</i>		†	†	†	†	†
*	...	...	...	10. <i>calidris</i>		...		*		
	*	...	...	11. <i>olivaceus</i>		...		...	*	*
	*	...	...	12. <i>magister</i>		*	*	*	*	*
		*	...	13. <i>bairdi</i>		...		*		
	*	...	...	14. <i>ochraceus</i>		*	*	*	*	
	†	...	...	9. <i>Cyclorhis</i>	†	...		†		
	*	...	...	15. <i>flaviventris</i>	*	...		...		
		*	...	16. <i>insularis</i>		...		*		
	†	...	...	10. <i>Tachycineta</i>	†	†				
	*	...	...	17. <i>albilinea</i>	*	*				
†	...	...	...	11. <i>Cœreba</i>		...		†		
*	...	...	...	18. <i>cyanea</i>		...		*		
†	...	...	...	12. <i>Certhiola</i>		†		†		
		*	...	19. <i>caboti</i>		*		*		
†	...	...	...	13. <i>Euphonia</i>		...		†		
	*	...	...	20. <i>affinis</i>		...		*		
		†	...	14. <i>Spindalis</i>		...		†		
		*	...	21. <i>benedicti</i>		...		*		
†	...	...	...	15. <i>Pyranga</i>	†	...	†	†		
	*	...	...	22. <i>roseigularis</i>	*	...	*	*		
	†	...	...	16. <i>Phœnicothraupis</i>	†	...	†			
		*	...	23. <i>insularis</i>	*	...	*			
	†	...	...	17. <i>Eucometis</i>	†					
	*	...	...	24. <i>spodocephala</i>	*					
	†	...	...	18. <i>Cardinalis</i>	†	†	†	†		
	*	...	...	25. <i>coccineus</i>	*	*	*	*		
	†	...	...	19. <i>Guiraca</i>	†	...	†			
	*	...	...	26. <i>parellina</i>	*	...	*			
	†	...	...	20. <i>Spermophila</i>	†	...	†			
	*	...	...	27. <i>moreleti</i>	*	...	*			
†	...	...	...	21. <i>Phonipara</i>		†	...	†		
		*	...	28. <i>intermedia</i>	...	*	...	*		
3	15	2	8	Carried forward.....	10	8	9	19	4	3

Islands, Mainland, and West Indies.	Islands and Main- land.	Islands and West Indies.	Islands only.		Meco.	Holbox.	Mugeres.	Cozumel.	Ruatan.	Bonacca.
3	15	2	8	Brought forward	10	8	9	19	4	3
	†	...	...	22. Spizella	...	...	...	...	†	
	*	...	...	29. pinetorum	...	...	...	...	*	
	†	...	...	23. Embernagra	†					
	*	...	...	30. verticalis	*					
†	...	...	...	24. Chrysomitris	...	...	†			
	*	...	...	31. mexicana	...	...	*			
†	...	...	...	25. Agelæus	...	...	†			
	*	...	...	32. phœniceus	...	...	*			
†	...	...	...	26. Icterus	†	†	†	†	†	
	*	...	...	33. giraudi	*	...	...	...	*	
	*	...	...	34. cucullatus	*	*	*	*		
	*	...	...	35. auratus	*					
	*	...	...	36. gularis	...	...	...	*		
†	...	...	...	27. Quiscalus	...	...	†	†	†	
	*	...	...	37. macrurus	...	...	*	*	*	
	†	...	...	28. Cyanolyca	†	†				
	*	...	...	38. yucatanica	*	*				
	†	...	...	29. Xanthura	...	...	...	†		
	*	...	...	39. luxuosa	...	...	...	*		
	†	...	...	30. Camptostoma	...	...	...	†		
	*	...	...	40. imberbe	...	...	...	*		
†	...	...	...	31. Elaenia	†	†	†	†		
	*	...	...	41. martinica	*	*	*	*		
†	...	...	...	32. Myiopagis	...	...	†	†		
	*	...	...	42. placens	...	...	*	*		
†	...	...	...	33. Pitangus	...	...	†	†		
	*	...	...	43. derbianus	...	...	*	*		
	†	...	...	34. Myiobius	...	...	...	†		
	*	...	...	44. sulphureipygius	...	...	...	*		
	†	...	...	35. Pyrocephalus	...	†	†	†		
	*	...	...	45. rubineus	...	*	*	*		
†	...	...	...	36. Contopus	...	...	...	†		
	*	...	...	46. brachytarsus	...	...	...	*		
†	...	...	...	37. Myiarchus	...	...	...	†	†	
	*	...	...	47. magister	...	...	...	*	*	
	*	...	...	48. yucatanensis	...	...	...	*	*	
	*	...	...	49. lawrencii	...	...	...	*	*	
†	...	...	...	38. Tyrannus	†	†	†	†		
	*	...	...	50. melancholicus	*	*	*	*		
	...	...	...	51. griseus	...	...	...	*		
	*	...	...	52. magnirostris	...	...	*			
	†	...	...	39. Pipra	†	†				
	*	...	...	53. mentalis	*	*				
†	...	...	...	40. Hadrostomus	...	†	...	†		
	*	...	...	54. aglaia	...	*	...	*		
	†	...	...	41. Attila	†	†	†	†		
	*	...	...	55. cozumelæ	...	...	...	*		
	*	...	...	56. citriopygius	*	*	*			
4	39	4	9	Carried forward	19	16	20	37	9	3

Islands, Mainland, and West Indies.	Islands and Main- land.	Islands and West Indies.	Islands only.		Meco.	Holbox.	Mugeres.	Cozumel.	Ruatan.	Bonacca.
4	39	4	9	Brought forward	19	16	20	37	9	3
	†	...	...	42. <i>Dendromis</i>	†					
	*	...	...	57. <i>eburneirostris</i>	*					
	†	...	...	43. <i>Dendrocincila</i>	†	...	†			
	*	...	...	58. <i>homochrous</i>	*	...	*			
	†	...	...	44. <i>Thamnophilus</i>	†					
	*	...	...	59. <i>doliatus</i>	*					
†	...	...	...	45. <i>Lampornis</i>	†	†	†	†	...	†
*	...	...	...	60. <i>prevosti</i>	*	*	*	*	...	*
†	...	...	...	46. <i>Doricha</i>	†	†				
*	...	...	...	61. <i>eliza</i>	...	*				
	†	...	...	47. <i>Amazilia</i>	...	†				
	*	...	...	62. <i>cinnamomea</i>	...	*				
	†	...	...	48. <i>Chlorostilbon</i>	...	†	†	†	†	†
	...	*	...	63. <i>forficatus</i>	...	*	*	*		
	*	...	...	64. <i>caniveti</i>	...			...	*	*
†	...	...	...	49. <i>Chaetura</i>	...			†		
	*	...	...	65. <i>gaumeri</i>	...			*		
†	...	...	...	50. <i>Nyctibius</i>	...				†	
*	...	...	...	66. <i>jamaicensis</i>	...			...	*	
	†	...	...	51. <i>Nyctidromus</i>	...		†	†		
	*	...	...	67. <i>albicollis</i>	...		*	*		
	†	...	...	52. <i>Dryobates</i>	...			†		
†	*	...	...	68. <i>scalaris</i>	...			*		
	...	...	...	53. <i>Centurus</i>	†			†	†	†
	*	...	...	69. <i>rubriventris</i>	...			*	...	*
	*	...	...	70. <i>dubius</i>	*			*		
	...	*	...	71. <i>canescens</i>	...			...	*	
	†	...	...	54. <i>Eumomota</i>	†					
†	*	...	...	72. <i>superciliaris</i>	*					
*	...	...	...	55. <i>Ceryle</i>	...			†	†	
	*	...	...	73. <i>alcyon</i>	...			*	*	
	†	...	...	+ 74. <i>superciliosa</i>	...			*		
†	*	...	...	56. <i>Trogon</i>	†					
*	...	...	...	+ 75. <i>melanocephalus</i>	*					
	...	...	...	57. <i>Orotophaga</i>	...	†	†	†	†	
	*	...	...	76. <i>ani</i>	...			*	*	
	†	...	...	77. <i>sulcirostris</i>	...	*	*	*		
†	*	...	...	58. <i>Piaya</i>	†	†	†			
	...	...	...	78. <i>cayana</i>	*	*	*			
*	...	...	...	59. <i>Coccyzus</i>	...			†	†	
	†	...	...	79. <i>minor</i>	...			*	*	
†	*	...	...	60. <i>Rhamphastos</i>	†					
	...	...	...	80. <i>carinatus</i>	*					
†	*	...	...	61. <i>Conurus</i>	...	†				
†	...	...	...	+ 81. <i>astec</i>	...	*				
	*	...	...	62. <i>Chrysotis</i>	...			†	†	
	*	...	...	+ 82. <i>auripalliat</i>	...			...	*	
	*	...	...	83. <i>autumnalis</i>	...			...	*	
	*	...	...	84. <i>xantholora</i>	...			*		
10	59	4	11	Carried forward	28	23	26	50	17	6

Islands, Mainland, and West Indies.	Islands and Main- land.	Islands and West Indies.	Islands only.		Meco.	Holbox.	Mugeres.	Cozumel.	Ruatan.	Bonaca.
10	59	4	11	Brought forward	23	23	26	50	17	6
	†	...	...	63. Ciccaba	†					
	*	...	...	85. <i>virgata</i>	*					
†	...	...	...	64. <i>Glaucidium</i>				†		
	*	...	...	86. <i>phalaenoides</i>				*		
	†	...	...	65. <i>Asturina</i>	†	†		†	†	†
	*	...	...	87. <i>plagiata</i>					*	
	*	...	...	88. <i>ruficauda</i>	*	*		†	*	*
	†	...	...	66. <i>Buteola</i>				*		
	*	...	...	89. <i>brachyura</i>				*		
†	...	...	...	67. <i>Urubitinga</i>				†		
	*	...	...	90. <i>anthracina</i>				*		
	†	...	...	63. <i>Geranospizias</i>	†					
	*	...	...	91. <i>nigra</i>	*					
	†	...	...	69. <i>Hypotriorchis</i>					†	
	*	...	...	92. <i>ruficularis</i>					*	
	†	...	...	70. <i>Ictinia</i>					†	
	*	...	...	93. <i>plumbea</i>					*	
†	...	...	...	71. <i>Cathartes</i>				†		
*	...	...	...	94. <i>aura</i>				*		
	†	...	...	72. <i>Tigrisoma</i>				†		
	*	...	...	95. <i>cabanisi</i>				*		
†	...	...	...	73. <i>Dendrocygna</i>				†		
	*	...	...	96. <i>autumnalis</i>				*		
	†	...	...	74. <i>Cairinia</i>				†		
	*	...	...	97. <i>moschata</i>				*		
†	...	...	...	75. <i>Columba</i>				†	†	
*	...	...	...	98. <i>leucocephala</i>				*	*	
†	...	...	...	76 [†] <i>Zenaida</i>		†	†			
*	...	...	...	99. <i>anabilis</i>		*	*			
†	...	...	...	77. <i>Chamaepelia</i>		†	†	†		
*	...	...	...	100. <i>passerina</i>		*	*	*		
	*	...	...	101. <i>rufipennis</i>				†		
†	...	...	...	78. <i>Engyptila</i>		†	†	*		
*	...	...	...	102. <i>jamaicensis</i>		*	*	*		
	†	...	...	79. <i>Crax</i>				†		
	*	...	...	103. <i>globoicera</i>				*		
	†	...	...	80. <i>Ortalis</i>	†	†				
	*	...	...	104. <i>vetula</i>	*	*				
	†	...	...	81. <i>Aramides</i>				†		
	*	...	...	105. <i>albiventris</i>				*		
†	...	...	...	82. <i>Porzana</i>				†		
	*	...	...	106. <i>rubra</i>				*		
†	...	...	...	83. <i>Aramus</i>				†		
*	...	...	...	107. <i>giganteus</i>				*		
†	...	...	...	84. <i>Parra</i>				†		
*	...	...	...	108. <i>gymnostoma</i>				*		
17	76	4	11	Totals	32	28	29	67	22	7

I think therefore that Meco, so far as its birds are concerned, should be considered an integral part of the mainland of Northern Yucatan*.

This removes 9 genera and as many species from the list, and leaves 75 genera and 99 species to be examined.

Of the 75 genera, *Melanoptila* is the only genus found in the islands and the adjoining mainland to the exclusion of the rest of Central America, and *Spindalis* is the only genus belonging to the West Indies to the exclusion of the continent. Forty-three genera are common to the islands, the continent, and to some one or more of the West Indies. The remaining 30 (or 31, including *Melanoptila*) are shared by the islands and mainland to the exclusion of the West Indies.

It will thus be seen that the relationship of the islands to the mainland is very much closer than it is to the West Indies, so far as regards genera, though *Spindalis* is a remarkable exception.

Next, as regards species, of which there are 99 to be considered (*i. e.* 108, less 9 belonging only to Meco). Of these 17 are common to the islands, the mainland, and one or more of the West Indies; 67 (*i. e.* 76, less 9 Meco birds) are common to the islands and the mainland to the exclusion of the West Indies; 4 are common to the islands and West Indies to the exclusion of the mainland; and 11 are peculiar to the islands alone.

Of the 67 species found on the islands and mainland to the exclusion of the West Indies, 10 are found nearly exclusively on the mainland immediately adjoining the islands; the remaining 57 are of wider range. The 10 species are the following:—

- | | |
|---------------------------------------|------------------------------------|
| 1. <i>Melanoptila glabrirostris</i> . | 6. <i>Cyanolyca yucatanica</i> . |
| 2. <i>Vireo magister</i> . | 7. <i>Myiarchus yucatanensis</i> . |
| 3. <i>Pyranga roseigularis</i> . | 8. <i>Centurus dubius</i> . |
| 4. <i>Spizella pinetorum</i> . | 9. <i>Centurus rubriventris</i> . |
| 5. <i>Icterus auratus</i> . | 10. <i>Chrysotis xantholora</i> . |

* I have not been able to find any trace of Meco Island on the chart; but there is a place marked as El Meco on the mainland near the coast opposite Muges Island. Mr. Gaumer's labels, however, give Meco

The four species found in the islands and the West Indies to the exclusion of the mainland are :—

1. *Polioptila cæsiogaster*?, Cozumel, Ruatan, and Bahamas.
2. *Dendræca petechia*, Cozumel and Jamaica.
3. *Elainea martinica*, several islands and Lesser Antilles.
4. *Tyrannus magnirostris*, Muges and Cuba.

Besides these the following species, though also found on the mainland, belong rather to the West-Indian fauna :—

Vireo calidris, Cozumel and most of the West-Indian islands.

Tyrannus griseus, Cozumel and all the more northern Antilles.

✓ *Crotophaga ani**, Cozumel, Ruatan, and the Antilles generally.

+ *Zenaida amabilis*, Holbox, Muges, and most of the Antilles.

+ *Engyptila jamaicensis*, Holbox, Muges, Cozumel, and Jamaica.

To complete the list of birds with special West-Indian affinities, the following peculiar species must be added :—

Certhiola caboti, Holbox and Cozumel, nearest to *C. bahamensis* of the Bahamas.

Spindalis benedicti, Cozumel, nearest to *S. pretrii* of Cuba and *S. zena* of the Bahamas.

Lastly, the species peculiar to the islands are 11 in number, viz. :—

1. *Harporhynchus guttatus*, Cozumel.
2. *Troglodytes beani*, Cozumel.
3. *Vireo bairdi*, Cozumel.
4. *Cyclorhis insularis*, Cozumel.

Island so distinctly, that I infer that the place he visited was some small island or cay that has escaped the cartographers. It must, however, be well wooded to harbour such birds as species of *Eucometis*, *Embernagra*, *Cyanolyca*, *Pipra*, *Attila*, *Dendrornis*, *Thamnophilus*, *Trogon*, *Rhamphastos*, &c., &c.

* It seems proper to consider this species as West Indian, so far as the islands now under consideration are concerned. It is, however, the prevalent species at Panama.

5. *Certhiola caboti*, Holbox and Cozumel.
6. *Spindalis benedicti*, Cozumel.
7. *Phænicothraupis insularis*, Meco, Mugerres.
8. *Phonipara intermedia*, Holbox, Cozumel.
9. *Attila cozumelæ*, Cozumel.
10. *Chlorostilbon forficatus*, Holbox, Mugerres, Cozumel.
11. *Centurus canescens*, Ruatan.

All of these are of mainland affinities, except *Certhiola caboti* and *Spindalis benedicti*.

It will be seen from the foregoing lists that the affinities of the birds of these islands, as a whole, as might have been expected from their position, are largely on the side of those of the mainland. Still there is a West-Indian element, only just to be traced in Northern Yucatan by the presence of such birds as *Petrochelidon fulva* (not yet noticed on the Yucatan islands), *Zenaida amabilis*, and *Engyptila jamaicensis*, which is more strongly developed in the islands. At the same time it is clear that the West-Indian birds found on them are either specifically identical or so closely related as to be separable only by some slight modification of colour.

These differences being so slight, it is hardly possible that the West-Indian element in these islands can be due to any ancient land-connexion with the West Indies. For, from Prof. Agassiz's contour map of the Caribbean Sea ("Three Cruises of the 'Blake,'" i. p. 98, fig. 57), it will be seen that the whole of Northern Yucatan and the islands adjoining are separated from Cuba by a depth of over 1000 fathoms, and the Bay Islands from Jamaica by over 500 fathoms, and that all the islands themselves lie within the 100-fathom line of the mainland coast. If there had been any recent land-connexion, a supposition which the similarity of the birds alone would justify, the mainland, as well as the West Indies, would hardly fail to show such a connexion in a much more pronounced manner, and we should find, not the strong contrast that exists between the faunas of Cuba and Jamaica and the mainland, but a large number of features in common.

The alternative supposition to account for the West-Indian

element in these islands is that the birds have reached them at no distant date by flight. When we consider that the trade-wind blows almost continuously over Cuba and Jamaica in the direction of Yucatan and this coast for several months in the year, it is hardly a matter of wonder that some West-Indian birds do stray so far west.

We should, however, expect to find more of them on the mainland. That this is not the case may be due to the imperfect way in which nearly the whole of this coast has been explored. No collections whatever have been made from any point between Belize and Cape Catoche, and the coast of British Honduras has only been touched in a very imperfect way.

I anticipate therefore that as our knowledge of the immediate mainland becomes more advanced, the peculiarities of these islands as regards their West-Indian element will diminish, if not altogether disappear.

I have hitherto treated of these coast-islands as a whole, but on examining them in detail they split up naturally into three groups. Leaving Meco out of the question, Holbox and Mugerres may be classed together, Cozumel by itself, and the Bay Islands of Ruatan and Bonacca by themselves.

HOLBOX and MUGERRES.—The bird-fauna of these islands closely resembles that of the mainland. Of the 70 recorded specimens, 26 are migrants, 1 has a very wide range, and 43 form the more localized resident fauna. Of these 43 species, the following 6 are more or less associated exclusively with the West Indies:—(1) *Certhiola caboti* (also found on Cozumel), a peculiar species, but very closely allied to *C. bahamensis*; (2) *Phonipara intermedia* (also found on Cozumel), very close to *P. olivacea* of the West Indies and to *P. pusilla* of the mainland; (3) *Elainea martinica* (also found on several other islands), a common species of the Lesser Antilles, but very closely allied to *E. pagana* of the mainland; (4) *Tyrannus magnirostris*, identical with the Cuban bird. The remaining two are (5) *Zenaida amabilis* and (6) *Engyptila jamaicensis*, both also found on the mainland. Of the 37 mainland forms, *Phænicothraupis insularis* and *Chloro-*

stilbon forficatus alone can at present claim to be peculiar, but both of them are also found on other islands. Holbox and Mugerres therefore have a very decided mainland affinity as regards their birds, a very slight peculiarity, and a West-Indian element, due most probably to quite recent or not distant casual immigration.

COZUMEL.—The larger size of Cozumel and the greater time spent over the examination of its fauna gives us a total of 159 species as found within its limits. Of these 65 are migrants and 27 birds of very wide range. This leaves 66 as the number of resident species, with more or less restricted limits; 52 of these are also characteristic of the mainland, 4 are shared with other islands, 4 are strictly West-Indian, and 6 are peculiar. Of the latter, *Spindalis benedicti* is the only one with West-Indian affinity, the others are modified mainland forms. *Harporhynchus ocellatus*, one of these, is remarkable as representing a genus not found nearer than the State of Vera Cruz or the northern shore of the Gulf of Mexico. Its presence in Cozumel must be attributed to casual introduction at a somewhat remote date, due perhaps to the severe northern storms which prevail in this region during the winter months.

Thus Cozumel would seem to have been separated from the mainland for a considerable period, during which time it has received casual immigrants from the West Indies, from North America, and from the mainland, some of them at dates sufficiently long ago to allow of their modification.

RUATAN and BONACCA.—These islands are very different in their physical features from those just mentioned. They are high, attaining an elevation of about 1200 feet, and have the upper portion covered with pines, instead of being low islands of recently elevated coral limestone. Mr. Gaumer's collections from these islands include specimens of 72 species, of which 42 are migrants, and 5 are of very wide range. The remaining 25 also belong almost exclusively to the mainland; but there is a decided element amongst these, with an affinity to the coast of Yucatan and its islands rather than to the coast immediately opposite. This is shown by the

presence of *Vireo magister*, *V. ochraceus*, *Centurus rubri-ventris*, and *C. canescens*. *Crotophaga ani* is the only West-Indian representative, and also belongs to Cozumel. It is difficult to account for this northern element, unless it be due to the northerly gales already mentioned. The trade-winds that strike the Bay Islands blow over the widest part of the Caribbean Sea and bring no stragglers from the West Indies.

X.—On the Birds of the Bonin Islands.

By HENRY SEEBOHM, F.Z.S.

THE arrival of a small box of bird-skins from the Bonin Islands makes it possible to clear up some of the difficulties which have surrounded the avifauna of this interesting but neglected group.

Mr. P. A. Holst left Yokohama on the 6th of April, 1889, and spent the greater part of May, June, July, and August on the Bonin Islands, calling at some of the Seven Islands both in going and returning. Collections were made at the following localities :—

Hatchinow-Shima, or Fatsizio Island, about 200 miles south of Yokohama ;

Muco-Shima and Nakondo-Shima, two of the Parry Islands, nearly 600 miles south of Yokohama ;

Chichi-Shima, or Peel Island, about 40 miles further south ;

Haha-Shima, or Hillsborough Island, one of the Coffin Islands or Baily Islands, about 40 miles south of Peel Island.

The Bonin Islands were visited in 1827 by Captain Beechey, during the voyage of the ' Blossom ;' but the zoological discoveries were not published until 1839 (' The Zoology of Captain Beechey's Voyage to the Pacific and Behring's Straits, performed in H.M.S. *Blossom* under the command of Captain F. W. Beechey in the years 1825–28 : ' Ornithology, by N. A. Vigors).

In 1828 they were visited by Baron F. H. von Kittlitz ;